AMENDMENTS TO THE CLAIMS

Claims 1-139. (Canceled).

140. (Previously presented) A micro pumping system for generating a liquid flow in at least one micro channel holding a liquid, the system comprising

a substrate holding at least one micro channel with at least a first section having a first surface part and at least a second section having a second surface part,

a light source adapted to emit a light beam, and

moving means for inducing a relative movement between the light beam and the substrate,

the means for moving being adapted to move between at least a first position in which the light beam will irradiate the first surface part and a second position in which the light beam will irradiate the second surface part whereby at least one vapour bubble is formed acting on the liquid in the first and second section of the micro channel, respectively, in response to the irradiation of the respective surface parts of the micro channel.

141. (Previously presented) A micro pumping system according to claim 140, wherein the light beam is continuously irradiating the micro channel when moving from the first position to the second position, creating at least one vapour bubble traveling from the first section to the second section.

142. (Previously presented) A micro pumping system according to claim 140, wherein at least a first vapour bubble is formed in response to the light beam irradiating the first surface part and at least a second vapour bubble is formed in response to the light beam irradiating the second surface part.

143. (Previously presented) A micro pumping system according to claim 142, wherein the at least second vapour bubble is formed before the at least first vapour bubble is collapsed.

144. (Previously presented) A micro pumping system according to claim 140, wherein at least one surface part of the micro channel comprises a light absorbing material for absorption of optical energy.

145. (Previously presented) A micro pumping system according to claim 140, further comprising light beam control means for controlling parameters of the light beam.

146. (Previously presented) A micro pumping system according to claim 145, wherein the light beam control means are adapted to control the parameters of the light beam to provide heating of a liquid in the micro channel.

147. (Previously presented) A micro pumping system according to claim 146, wherein the light beam has an energy density adequate to heat at least a part of the liquid to a temperature below the boiling point of said liquid.

148. (Previously presented) A micro pumping system according to claim 146, wherein the energy density for heating a substantial amount of liquid is lower than the energy density for inducing bubble formation.

149. (Previously presented) A micro pumping system according to claim 146, further comprising a thermopile element for detection of liquid temperature.

150. (Previously presented) A micro pumping system according to claim 140, wherein the means for moving the light beam in relation to the substrate comprises means for moving the substrate.

151. (Previously presented) A micro pumping system according to claim 140, wherein the means for moving the light beam in relation to the substrate comprises means for moving the light source.

152. (Previously presented) A micro pumping system according to claim 140, wherein the means for moving the light beam in relation to the substrate comprises means for moving the light beam.

153. (Previously presented) A micro pumping system according to claim 140, further comprising a focusing means for focusing the light beam at a selected location.

154. (Currently amended) A micro pumping system according to claim 153, wherein ~~the~~ an energy density and/or an irradiation period of the light source is selected to form a vapour bubble having dimensions corresponding to micro channel dimensions

155. (Previously presented) A micro pumping system according to claim 154, wherein two fluctuating vapour bubbles are formed in two adjacent sections of the micro channel, the fluctuation being controlled so as to sustain at least one vapour bubble restriction in the channel.

156. (Previously presented) A micro pumping system according to claim 140, wherein the light source is a laser

157. (Currently amended) A micro pumping system according to claim 140, wherein the micro channel comprises at least a first liquid and a second liquid to be mixed, and wherein at least a first vapour bubble is formed in the at least first liquid in response to the irradiation of a first surface part of at least a first section, the vapour bubble being adapted to extend into the second liquid, thereby increasing ~~the~~ a boundary surface area between the first and the second liquid.

158. (Previously presented) A micro pumping system for pumping a liquid in a micro channel, the system comprising

a substrate holding at least one micro channel with at least a first section having a first surface part and at least a second section having a second surface part,

a light source adapted to emit a light beam, and

means for moving the light beam in relation to the substrate,

the means for moving being adapted to move between at least a first position in which the light beam will irradiate the first surface part and a second position in which the light beam will irradiate the second surface part whereby at least a first vapour bubble is formed acting on the liquid in the first section and at least a second vapour bubble is formed acting on the liquid in the second section of the micro channel, respectively, in response to the irradiation of the respective surface parts of the micro channel, wherein the at least second vapour bubble is formed before the at least first vapour bubble is collapsed so as to provide a pumping action/so as to move liquid in the direction from the first to the second section.

159. (Currently amended) A micro pumping system according to claim 140, said micro pumping system furthermore comprising a sub-system selected from the group consisting of ~~a~~ micro mixing ~~system~~ means, ~~a~~ micro valve ~~system~~ means, and a thermal reactor ~~system~~.

160. (Previously presented) A method of generating a liquid flow in at least one micro channel, the method comprising

providing at least one substrate holding at least one micro channel, emitting at least one light beam from at least one light source,

inducing a relative movement between the at least one light beam and the at least one substrate so that the at least first light beam in a first position irradiates the first surface part and in a second position irradiates the second surface part,

forming at least a first vapour bubble in the at least first section in response to the irradiation of the first surface part,

forming at least a second vapour bubble in the at least second section in response to the irradiation of the second surface part,

the at least first and second vapour bubbles acting on the liquid in the first and second section of the micro channel, respectively, so as to generate a flow in the micro channel.

161. (Previously presented) A method according to claim 160, comprising the step of continuously irradiating the micro channel when moving from the first position to the second

position, creating at least one vapour bubble travelling from the first section to the second section.

162. (Previously presented) A method according to claim 161, wherein at least a first vapour bubble is formed in response to the light beam irradiating the first surface part and at least a second vapour bubble is formed in response to the light beam irradiating the second surface part.

163. (Previously presented) A method according to claim 162, wherein the at least second vapour bubble is formed before the at least first vapour bubble is collapsed.

164. (Currently amended) A method according to claim 159, wherein the micro pumping system is working bi-directionally.

165. (Previously presented) A method according to claim 159, wherein at least one surface part of the micro channel comprises a light absorbing material for absorption of optical energy.

166. (Currently amended) A method according to claim 164, wherein ~~the~~ optical energy is absorbed directly in the liquid in the irradiated section.

167. (Previously presented) A method according to claim 159, wherein the vapour bubble is formed by film boiling at least a part of the liquid in response to the light beam irradiation.

168. (Previously presented) A method according to claim 159, further comprising focusing the light beam at a selected location by adjusting focusing means.

169. (Previously presented) A method according to claim 159, wherein the light source is a laser

170. (Previously presented) A method of pumping a liquid in a micro channel, the method comprising the steps of

providing a substrate holding at least one micro channel with at least a first section having a first surface part and at least a second section having a second surface part,

emitting a light beam from a light source, and

inducing a relative movement between the light beam and the substrate, so that the light beam in a first position irradiates the first surface part and in a second position irradiates the second surface part

forming at least a first vapour bubble in the at least first section in response to the irradiation of the first surface part,

forming at least a second vapour bubble in the at least second section in response to the irradiation of the second surface part,

wherein the at least second vapour bubble is formed before the at least first vapour bubble is collapsed so as to provide a pumping action.

171. (Previously presented) A method according to claim 170, wherein the relative movement is obtained by moving the substrate, the light source, and/or the light beam.